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10/685,550	10/14/2003	Wayne G. Renken	SENS.005US1	4924
36257	7590	08/22/2007	EXAMINER	
DAVIS WRIGHT TREMAINE LLP			SHAH, SAMIR M	
505 MONTGOMERY STREET				
SUITE 800			ART UNIT	PAPER NUMBER
SAN FRANCISCO, CA 94111			2856	
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			08/22/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/685,550	RENKEN, WAYNE G.	
	Examiner	Art Unit	
	Samir M. Shah	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 29 June 2007.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 21-25, 27-36, 45, 46 and 55-69 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) 45, 46 and 55-69 is/are allowed.

6) Claim(s) 21-25 and 27-36 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 6/24/2004; 7/26/2004.
4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
5) Notice of Informal Patent Application
6) Other: ____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/29/2007 has been entered.

Information Disclosure Statement

2. Applicant's argument, "references submitted in Supplemental Information Disclosure Statements dated July 22, 2004 and July 23, 2004", appears to be in error.

However, the information disclosure statements (IDS) submitted on June 24, 2007 and July 26, 2004 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

Response to Arguments

3. Applicant's arguments, see page 8, filed 6/29/2007, with respect to claims 45 and 46 have been fully considered and are persuasive. The objection of claims 45 and 46 has been withdrawn.

Accordingly, independent claim 45 and its dependent claim 46 are allowed.

4. Applicant's arguments filed 6/29/2007, with respect to the 35 U.S.C. 102(b) rejection of claims 21, 28, 30, 31 and 35 as being anticipated by Lauf et al. (US Patent 5,969,639 henceforth "Lauf) have been fully considered but they are not persuasive.

(a) [Claim 21] As to Applicant's argument, "Lauf does not disclose, suggest or inherently require a sensing substrate and a separate electronics module that are connected together by flexible leads in order to allow relative movement between them", the Examiner disagrees.

The term "flexible" is a term of degree and the leads (740) disclosed by Lauf are inherently flexible up to a certain degree. Similarly, the term "relative movement" is also a term of degree and the connecting leads (740) would inherently allow relative movement between the substrate/wafer (710) and the electronics module/circuit (730).

Lauf discloses leads (740) connecting electronic module/signal conditioning circuit (730) to different sensors/transducers (720) mounted on the substrate/wafer (710) (figures 7, 10; column 3, lines 45-61).

It is suggested that independent claim 21 be appropriately modified to better define the phrases "flexible" and "relative movement" in order to positively recite these terms of degree.

(b) [Claim 31] As to Applicant's argument, "claim 31 is...novel over Lauf for the additional reason that an IR transceiver both sends and receives IR signals", the Examiner partly disagrees.

The Examiner agrees with Applicant's assertion that a transceiver both sends and receives signals. However, in addition to IR emitting diodes, Lauf also discloses "IR detector(s)" that could "respond to changing IR signals associated with the signal from the infrared emitting diode that is intended to be interrogated" (column 5, lines 25-55, especially lines 45-55). Thus, Lauf discloses both sending as well as receiving IR signals.

5. Since the Applicant has not provided any particular argument(s) with respect to "the numerous rejections under 35 U.S.C. §103(a) of other claims that depend from claim 21 over various combinations of Lauf and other references", these rejections are maintained.

Claim Objections

6. Claims 55 and 64 is objected to because of the following informalities:

- (a) As to claim 55, lines 11-12, delete "their first and second perimeters" and replace it with --the first and the second perimeter--.
- (b) As to claim 64, line 2, delete "connected a wired" and replace it with --connected to a wired--.

7. Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 21, 28, 30, 31 and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Lauf et al. (US Patent 5,969,639 henceforth “Lauf”).

(a) As to claims 21, 28, 30 and 35, Lauf discloses a process condition monitoring device comprising:

a substrate/wafer (710) having a first perimeter, the substrate/wafer (710) comprising sensors (720) to measure the processing conditions/temperature of the substrate/wafer (710) at different areas of the substrate/wafer (710) (figure 7; column 3, lines 46-50; column 6, lines 40-42);

an electronics module/signal conditioning circuit (730) having a second perimeter that encloses the same or less area than the first perimeter, the module/circuit (730) comprising (figure 7, column 3, lines 50-52; column 4, lines 15-18):

signal acquisition circuitry (“circuit 730 includes a clock and a memory whereby temperature data can be captured... and stored for later retrieval”) coupled to an output of the sensors (720) (figure 7; column 3, lines 63-66);

data transmission circuitry/transmitter (750) and antenna

(770) coupled to the signal acquisition circuitry (730) (figure 7; column 3, lines 52-61); a power source (760) (figure 7; column 3, lines 58-59); and leads (740) connecting the substrate/wafer (710) to the electronics module/signal conditioning circuit (730) for transmitting signals between the substrate/wafer (710) and the electronics module/signal conditioning circuit (730), the leads (740) providing a flexible connection that allows relative movement between the substrate/wafer (710) and the electronics module/signal conditioning circuit (730) (figure 7; column 3, lines 45-61); and

a remote data processing system/module (850) including an external data processing device, and wherein the data transmission circuitry/transmitter (750) and antenna (770) comprises a wireless/radio frequency (RF) transceiver to transmit the processing conditions to the remote system/module (850) (figures 7, 8; column 3, lines 52-61; column 4, lines 29-42).

(b) As to claim 31, Lauf discloses an infrared (IR) structure located on the surface of the wafer (710), which would enable the transmitting and receiving of IR signals (column 5, lines 25-55).

Claim Rejections - 35 USC § 103

10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

11. Claims 22, 24, 25, 27, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lauf, as applied to claims 21, 28, 30, 31 and 35 above, and further in view of Smesny et al. (US Patent 5,444,637 henceforth "Smesny").

(a) As to claim 22, Lauf does not expressly teach the signal acquisition circuitry being configured to amplify an output signal of the sensors. However, Lauf discloses that the sensors (720) could be thermocouple, diode, resistive temperature detectors (RTD) or thermistors (claim 7; column 2, lines 13-18; column 4, lines 29-34); Lauf also discloses that "either amplitude or frequency modulation can be used" (column 4, lines 25-28).

Smesny discloses a "programmable semiconductor wafer for sensing, recording and retrieving fabrication process conditions" including sensors (12), which could be thermistors, thermocouple or diode (column 8, lines 63-68; column 9, lines 1-27) and an amplifier (46) configured to amplify an output signal of the sensors (12) (figure 3; column 10, lines 38-51).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lauf's apparatus to include amplifying an output signal of the sensors (720), as suggested by Smesny, because sensors such as thermistors or RTD are well suited for producing an output voltage proportional to the sensor resistance and an amplified signal can be more accurately read/processed.

(b) As to claims 24 and 25, the resistance type temperature sensors of Lauf inherently require an input power signal in order to function as disclosed.

In the alternative, Smesny discloses a power supply (16) for "providing analog voltage level with sufficient current drive to sensors (12)" (column 8, lines 20-22).

It would be obvious to one of ordinary skill in the art at the time the invention was made to include a power supply for providing input power signals to sensors (720), as suggested by Smesny, because an input power signal is required for temperature sensors such as thermocouple or thermistors to function appropriately.

(c) As to claim 27, Lauf does not expressly teach that the data transmission circuitry/transmitter (750) and antenna (770) comprises an analog to digital converter. However, Lauf discloses that "the transmitted signals can be digital or analog (column 4, lines 25-28).

Smesny discloses a signal acquisition/conditioning circuit or an analog to digital (A/D) converter (52) which receives analog signals (30) from each of the sensors (12) placed upon the wafer (10) and converts the analog signals (30) to corresponding digital signals (figure 3; column 10, lines 38-68; column 11, lines 1-14).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lauf's apparatus to include converting analog signals to digital signals using an analog to digital converter, as suggested by Smesny, because digital signals can be more accurately processed by the data processing system/module

(850) including an external data processing device and digital signals would be easier to be converted into useful information (read Lauf, column 4, lines 37-42).

(d) As to claim 32, Lauf does not expressly disclose that the wireless/radio frequency (RF) transceiver/transmitter (750) and antenna (770) transmits and receives sonic signals.

Smesny discloses probe pad (26) providing an optical or acoustic/sonic connection with an external communication device in order to exchange data related to the real time processing conditions so that it can be optimally controlled.

It would be obvious to one of ordinary skill in the art at the time the invention was made to achieve Lauf's communication with the processing remote processing system by sending/receiving acoustic/sonic signals from/with the transmitter (750)/antenna (770), as suggested by Smesny, because such an acoustic/sonic communication would enable the data related to the real time processing conditions of wafer (710) to be communicated with the remote data processing system and thus be optimally controlled/processed.

(e) As to claim 33, Lauf does not expressly that the data transmission circuitry/transmitter (750) and antenna (770) comprises one or more connectors to couple a remote system to the device with a communications cable.

Smesny teaches probe pad (26), which can provide a mechanical access/connection of the wafer (10) to an external communication device.

It would be obvious to one of ordinary skill in the art at the time the invention was made to modify Lauf's apparatus to include mechanical connectors for connecting the data transmission circuitry/transmitter (750) and antenna (770) of the wafer (710) with a remote system, as suggested by Smesny, because this would allow mechanical access from an external output device such as, for instance, the data information stored within the memory of circuit (730).

12. Claims 23, 29 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lauf, as applied to claims 21, 28, 30, 31 and 35 above, and further in view of Schwartz et al. (US Patent 5,669,713 henceforth "Schwartz").

(a) As to claims 23, 29 and 34, Lauf does not expressly disclose that the electronics module/signal conditioning circuit (730) or the remote data processing system/module (850) (including an external data processing device) comprises a micro-controller and is configured to process the output signal using sensor calibration coefficients to provide a final output value.

Schwartz discloses, in a patent entitled "calibration of process control temperature transmitter", calibrating resistance or thermocouple type temperature sensors (16, 18), with a calibration device, in order to derive a calibration value R_{PRTCAL} (NEW) with a micro-controller/microprocessor (22) and provide a final output value (figure 5; column 1, lines 13-34; column 7, lines 30-67; column 8, lines 1-5)

It would be obvious to one of ordinary skill in the art at the time the invention was made to modify Lauf's apparatus to include a micro-controller for processing the output signals from the resistance type temperature sensors (720) using sensor calibration coefficients/values and get a final output value, as suggested by Schwartz, because this provides a compact device as a rapid and accurate means of correcting temperature values against an accurate standard.

While Schwartz teaches no particular location for where the calibration processing should occur, Examiner considers it would have been obvious to one of ordinary skill in the art at the time the invention was made to process the calibration of the signals either at the electronics module/signal conditioning circuit (730) or at the remote data processing system/module (850) (including an external data processing device), since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70 (CCPA 1950).

13. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lauf, as applied to claims 21, 28, 30, 31 and 35 above, and further in view of Renken et al. (US Patent 6,190,040 henceforth "Renken").

(a) As to claim 36, Lauf does not expressly disclose the leads (740) being from a ribbon cable.

Renken teaches ribbon cables 52, 62 in a similar application.

It would be obvious to one of ordinary skill in the art at the time the invention was made to modify Lauf's apparatus to include leads from a ribbon cable, as suggested by Renken, because such leads have many advantages like extremely small bending radius, high flexibility and minimum waste of space.

Allowable Subject Matter

14. Claims 45 and 46 are allowed.

15. Newly filed claims 55-69 are allowed.

Note, as to claim 55, lines 9-10, "first position wherein the electronics module is located above or below the substrate" is interpreted as a first position wherein the electronics module is located above or below the substrate in such a way that the first and the second perimeter do overlap.

Conclusion

16. The prior art made of record and not relied upon, cited in the attached 892 form, is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samir M. Shah whose telephone number is (571) 272-2671. The examiner can normally be reached on Monday-Friday 9:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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